Attorney Docket No. P11258

LISTING OF CLAIMS

1. (Previously Presented) A method of controlling a data unit oriented communication between a sender and a receiver operating in accordance with a predetermined communication protocol, said method comprising the steps of:

dividing, by the sender, an amount of data to be sent into a plurality of data units having a structure determined by the protocol;

transmitting initial data units from the sender to the receiver;

acknowledging, by the receiver, correct receipt of the initial data units by returning acknowledgment data units to the sender;

detecting a failure of the receiver to receive at least one data unit;

retransmitting, by the sender, the at least one data unit that the receiver failed to receive;

receiving at the sender, an acknowledgment data unit indicating that at least one of the data units was correctly received by the receiver;

determining whether the received acknowledgment data unit indicates that one of the correctly received data units was correctly received as a result of the transmitting step or as a result of the retransmitting step;

subsequently transmitting, by the sender, subsequent data units, said subsequent data units being transmitted in accordance with a flow control procedure conducted on the basis of at least one adaptive parameter, said subsequently transmitting step including:

performing an excessive delay/response procedure upon determining that the received acknowledgment data unit indicates that the at least one data unit was correctly received as a result of the transmitting step; and Too Long

performing a data unit loss response procedure upon determining that the received acknowledgment data unit indicates that the at least one data unit was correctly received as a result of the retransmitting step. Lost units

2. (Previously Presented) The method of claim 1, wherein the step of detecting a failure of the receiver to receive at least one data unit includes the steps of:

monitoring a time out period by the sender after the at least one data unit is sent, and;

If no acknowledgment data unit associated with the data unit is received before the time out period expires, triggering a time out mechanism that indicates the failure.

3. (Previously Presented) The method of claim 1, wherein the step of detecting a failure of the receiver to receive at least one data unit includes the steps of:

determining by the sender whether duplicate acknowledgment data units are received for a transmitted data unit; and

if a data unit is acknowledged a predetermined number of times, triggering a duplicate acknowledgment detection mechanism that indicates the failure.

4-5. (Canceled)

6. (Previously Presented) The method of claim 2, wherein the time out period is one of the adaptive parameters in the flow control procedure.

7. (Previously Presented) The method of claim 1, wherein the flow control procedure is window-based, and at least one flow control window is among the adaptive parameters in the flow control procedure.

8. (Canceled)

9. (Previously Presented) The method of claim 1, wherein the step of determining whether the received acknowledgment data unit indicates that the at least one data unit was correctly received as a result of the transmitting step or as a result of the retransmitting step includes the steps of:

marking the initial data units by the sender such that an original transmission can be distinguished from a retransmission; and

marking the acknowledgment data units by the receiver, such that an acknowledgment data unit associated with an initial data unit can be distinguished from an acknowledgment data unit associated with a retransmitted data unit.

10. (Previously Presented) The method of claim 9, wherein:

the step of marking the initial data units by the sender includes the step of including a time stamp in each initial data unit, the time stamp indicating the time the data unit was sent; and

the step of marking the acknowledgment data units by the receiver includes the step of including the time stamp contained in a given initial data unit in the acknowledgment data unit associated with the given initial data unit.

11. (Previously Presented) The method of claim 9, wherein:

the step of marking the initial data units by the sender includes the step of including a bit string in each initial data unit, the bit string having at least two different values for distinguishing between an original transmission and a retransmission; and

the step of marking the acknowledgment data units by the receiver includes the step of including the bit string contained in a particular initial data unit in the acknowledgment data unit associated with the particular initial data unit.

12. (Previously Presented) The method of claim 11, wherein the bit string consists of a single bit.

13. (Previously Presented) The method of claim 11, wherein the bit string consists of a plurality of bits, such that the bit string is capable of distinguishing between different retransmissions.

14. (Canceled)

15. (Currently Amended) ~~The method of claim 2, wherein the step of~~ A method of controlling a data unit oriented communication between a sender and a receiver operating in accordance with a predetermined communication protocol, said method comprising the steps of:

dividing, by the sender, an amount of data to be sent into a plurality of data units having a structure determined by the protocol;

transmitting initial data units from the sender to the receiver;

acknowledging, by the receiver, correct receipt of the initial data units by returning acknowledgment data units to the sender;

detecting a failure of the receiver to receive at least one data unit by monitoring a time out period by the sender after the at least one data unit is sent, and if no acknowledgment data unit associated with the data unit is received before the time out period expires, triggering a time out mechanism that indicates the failure;

retransmitting, by the sender, the at least one data unit that the receiver failed to receive;

receiving at the sender, an acknowledgment data unit indicating that at least one of the data units was correctly received by the receiver;

determining whether the received acknowledgment data unit indicates that the at least one correctly received data unit was correctly received as a result of the transmitting step or as a result of the retransmitting step ~~includes~~, said determining step including the steps of:

determining by the sender, a shortest round trip time associated with the correct receipt of an initial data unit;

measuring by the sender, a time period between the retransmission of a given data unit and the receipt of a first acknowledgment data unit associated with the given data unit;

comparing the shortest round trip time to the time period between the retransmission of the given data unit and the receipt of the first acknowledgment data unit; and

determining that the at least one data unit was correctly received as a result of the transmitting step if the time period between the retransmission of the given

data unit and the receipt of the first acknowledgment data unit is shorter than a predetermined fraction of the shortest round trip;

subsequently transmitting, by the sender, subsequent data units, said subsequent data units being transmitted in accordance with a flow control procedure conducted on the basis of at least one adaptive parameter, said subsequently transmitting step including:

performing an excessive delay response procedure upon determining that the received acknowledgment data unit indicates that the at least one data unit was correctly received as a result of the transmitting step; and

performing a data unit loss response procedure upon determining that the received acknowledgment data unit indicates that the at least one data unit was correctly received as a result of the retransmitting step.

16. (Canceled)

17. (Previously Presented) The method of claim 2, wherein the step of performing an excessive delay response procedure includes adapting the time out period on the basis of a time period measured between transmitting a given data unit and receipt of a first acknowledgment data unit associated with the given data unit.

18. (Previously Presented) The method of claim 2, wherein the flow control procedure for retransmitting the at least one data unit is window-based, and a congestion window is used, and the method further comprises the steps of:

storing the value of the congestion window upon detecting the failure of the receiver to receive the at least one data unit;

subsequently resetting the value of the congestion window to a predetermined value; and

upon performing the excessive delay response procedure, setting the value of the congestion window to the value it would have assumed, had the excessive delay response procedure not taken place.

19-34. (Canceled)

35. (Previously Presented) A device for controlling a data unit oriented communication between a sender and a receiver operating in accordance with a predetermined communication protocol, said device comprising:

means in the sender for dividing an amount of data to be sent into a plurality of data units having a structure determined by the protocol;

a data unit transmitter that transmits the data units from the sender to the receiver;

means in the receiver for acknowledging correct receipt of the transmitted data units by returning acknowledgment data units to the sender;

a data loss detection mechanism that detects a failure of the receiver to receive at least one data unit;

retransmission means in the sender that retransmits the at least one data unit that the receiver failed to receive;

receiving means in the sender for subsequently receiving an acknowledgment data unit indicating that the at least one data unit was correctly received by the receiver;

determining means for determining whether the received acknowledgment data unit indicates that the at least one data unit was correctly received as a result of the transmitting step or as a result of the retransmitting step;

means within the transmission means for subsequently transmitting subsequent data units utilizing a flow control procedure conducted on the basis of at least one adaptive parameter, said subsequent transmission means including:

an excessive delay response mechanism that performs an excessive delay response procedure in response to the determining means determining that the received acknowledgment data unit indicates that the at least one data unit was correctly received as a result of the transmitting step; and

a data unit loss response mechanism that performs a data unit loss response procedure in response to the determining means determining that the received acknowledgment data unit indicates that the at least one data unit was correctly received as a result of the retransmitting step.

36. (Previously Presented) The device of claim 35, wherein the data loss detection mechanism includes:

a first timer in the sender for monitoring a time out period after the at least one data unit is sent, and;

a time out mechanism that that indicates the failure of the receiver to receive the at least one data unit, said time out mechanism being triggered if no acknowledgment data unit associated with the data unit is received before the time out period expires.

37. (Previously Presented) The device of claim 35, wherein the data loss detection mechanism includes a duplicate acknowledgment detection mechanism in the sender that detects whether a predetermined number of duplicate acknowledgment data units are received for a transmitted data unit.

38. (Previously Presented) The device of claim 36, wherein the time out period is one of the adaptive parameters in the flow control procedure.

39. (Previously Presented) The device of claim 35, wherein the retransmission means includes a window-based flow control procedure, and at least one flow control window is among the adaptive parameters in the flow control procedure.

40. (Previously Presented) The device of claim 35, wherein the determining means includes:

marking means in the sender for marking the transmitted data units such that an original transmission can be distinguished from a retransmission; and

marking means in the receiver for marking the acknowledgment data units such that an acknowledgment data unit associated with an originally sent data unit can be distinguished from an acknowledgment data unit associated with a retransmitted data unit.

41. (Previously Presented) The device of claim 40, wherein:

the marking means in the sender includes a first time stamp mechanism that places a time stamp in each transmitted data unit, the time stamp indicating the time the data unit was sent; and

the marking means in the receiver includes a second time stamp mechanism that places the time stamp contained in a given transmitted data unit in the acknowledgment data unit associated with the given transmitted data unit.

42. (Previously Presented) The device of claim 40, wherein:

the marking means in the sender places a bit string in each transmitted data unit, the bit string having at least two different values for distinguishing between an original transmission and a retransmission; and

the marking means in the receiver places the bit string contained in a particular transmitted data unit in the acknowledgment data unit associated with the particular transmitted data unit.

43. (Previously Presented) The device of claim 42, wherein the bit string consists of a single bit.

44. (Previously Presented) The device of claim 42, wherein the bit string consists of a plurality of bits, such that the bit string is capable of distinguishing between different retransmissions.

45. (Previously Presented) The device of claim 35, wherein the determining means includes:

a first timer in the sender that measures a shortest round trip time associated with the correct receipt of a transmitted data unit;

a second timer in the sender that measures a time period between the retransmission of a given data unit and the receipt of a first acknowledgment data unit associated with the given data unit;

means for comparing the shortest round trip time to the time period between the retransmission of the given data unit and the receipt of the first acknowledgment data unit; and

means for determining that the at least one data unit was correctly received as a result of the transmitting step if the time period between the retransmission of the given data unit and the receipt of the first acknowledgment data unit is shorter than a predetermined fraction of the shortest round trip.

46. (Previously Presented) The device of claim 36, wherein the excessive delay response mechanism includes means for adapting the time out period on the basis of a time period measured between transmitting a given data unit and receipt of a first acknowledgment data unit associated with the given data unit.

47. (Previously Presented) The device of claim 36, wherein the subsequent transmission means includes a windows-based flow control procedure that utilizes a congestion window, and the device further comprises:

storage means for storing the value of the congestion window when the data loss detection mechanism detects the failure of the receiver to receive the at least one data unit;

means for subsequently resetting the value of the congestion window to a predetermined value; and

means for setting the value of the congestion window, after the excessive delay response mechanism performs the excessive delay response procedure, to a value that the congestion window would have assumed, had the excessive delay response procedure not taken place.

48. (Previously Presented) An improved method of controlling a data unit oriented communication between a sender and a receiver operating in accordance with a predetermined communication protocol, wherein the sender divides an amount of data into one or more data units having a structure determined by the protocol; the receiver acknowledges correct receipt of data units by returning acknowledgment data units to

the sender; and the sender sends the data units to the receiver in accordance with a flow control procedure conducted on the basis of one or more adaptive parameters and the acknowledgment data units, the flow control procedure including a data loss detection procedure that, responsive to one or more triggering events, indicates potential data loss in the communication, and a response procedure in which a given data unit is re-sent from the sender to the receiver, wherein the improvement comprises:

selecting by the response procedure, a mode for adapting the one or more adaptive parameters of the flow control procedure, said mode being selected from at least two different modes, and being selected based on one or more acknowledgment data units received by the sender after having re-sent the given data unit.

49. (Previously Presented) The method of claim 48, wherein the selecting step includes the steps of:

determining whether the received acknowledgment data units indicate that at least one data unit was correctly received as a result of being re-sent from the sender to the receiver;

selecting a mode for adapting the adaptive parameters to perform an excessive delay response procedure upon determining that it is not a result of being re-sent that the at least one data unit was correctly received; and

selecting a mode for adapting the adaptive parameters to perform a data unit loss response procedure upon determining that the at least one data unit was correctly received as a result of being re-sent.